

Chapter 11: Light

NCERT Exemplar · Class 6 · Science

Multiple Choice Questions

Question 1

Observe the picture given in Fig. 11.1 carefully.

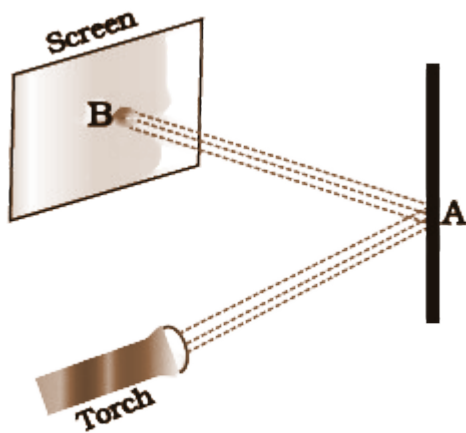


Fig. 11.1

A patch of light is obtained at B, when the torch is lighted as shown. Which of the following is kept at position A to get this patch of light?

A.

A wooden board

B.

A glass sheet

C.

A mirror

D.

A sheet of white paper

Answer

Correct option: C

Solution

Ans: The correct answer is (c) A mirror.

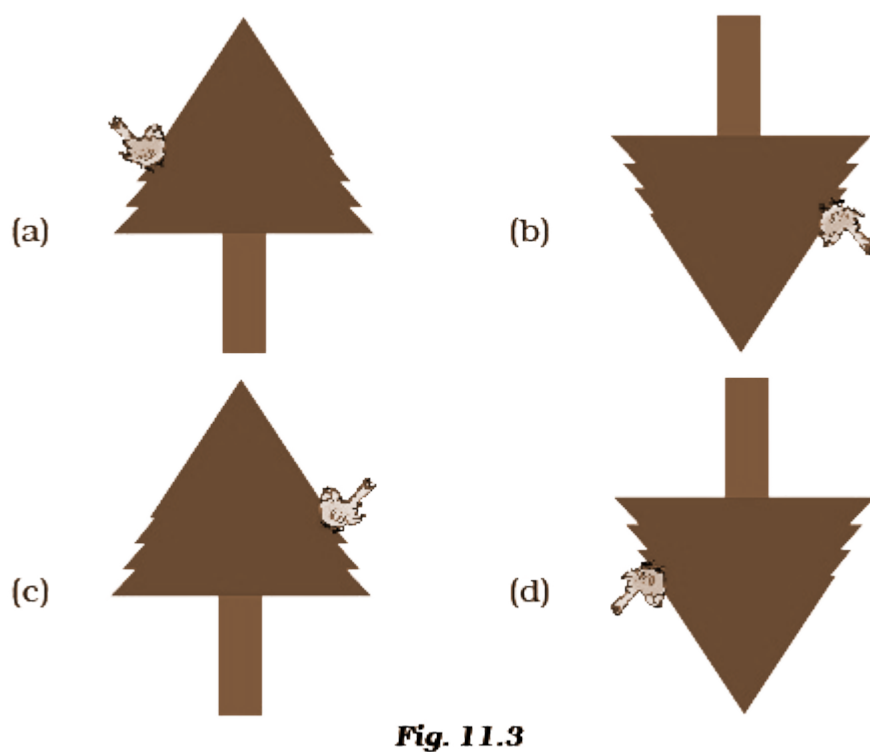
Explanation: Patch of light can be reflected only by a mirror and changes its direction.

Question 2

A student observes a tree given in Fig. 11.2 through a pinhole camera. Which of the diagrams given in Fig. 11.3 (a) to (d), depicts the image seen by her correctly?



Fig. 11.2



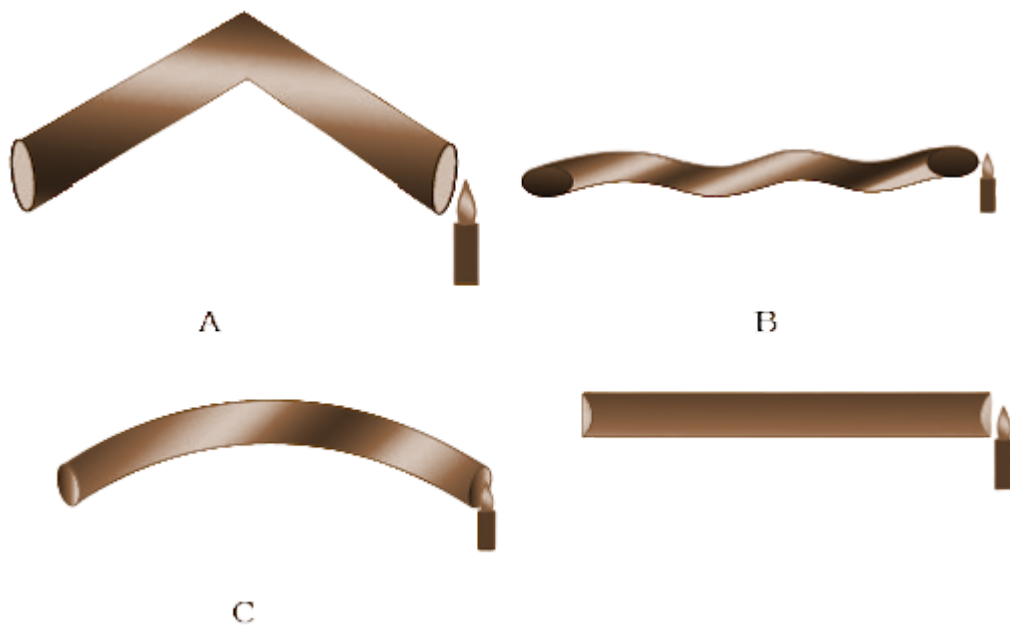
Solution

Ans: The correct answer is (b).

Explanation: The image formed will be left-right reversed and inverted.

Question 3

Four students A, B, C and D looked through pipes of different shapes to see a candle flame as shown in Fig. 11.4.



Who will be able to see the candle flame clearly?

A.

A

B.

B

C.

C

D.

D

Answer

Correct option: D

Solution

Ans: The correct answer is (d) D.

Explanation: As we can see, only in figure D tube is straight. So, we can clearly see candle flame through tube D.

Question 4

Which of the following is/are not always necessary to observe a shadow?

A.

Sun

B.

Screen

C.

Source of light

D.

Opaque object

Answer

Correct option: A

Solution

Ans: The correct answer is (a) Sun.

Explanation: Sun is a source of light and it can be replaced by any other source of light like, torch. Hence, the sun is not always necessary to observe a shadow.

Question 5

Paheli observed the shadow of a tree at 8 : 00 a.m., 12 : 00 noon and 3 : 00 p.m. Which of the following statements is closest to her observation about the shape and size of the shadow?

A.

The shape of the shadow of the tree changes but the size remains the same.

B.

The size of the shadow of the tree changes but the shape remains the same.

C.

Both the size and shape of the shadow of the tree change.

D.

Neither the shape nor the size of the shadow changes.

Answer

Correct option: C

Solution

Ans: The correct option is (c) Both the size and shape of the shadow of the tree change.

Explanation: Here, the source of light is the sun. Sun changes its position at different points of time. Thus, accordingly the shape and size of the shadow of the tree change.

Question 6

Which of the following can never form a circular shadow?

A.

A ball

B.

A flat disc

C.

A shoe box

D.

An ice cream cone

Answer

Correct option: C

Solution

Ans: The correct answer is (c) A shoe box

Explanation: Shape of the shoe box is either rectangular or square.

Question 7

Two students while sitting across a table looked down onto its top surface. They noticed that they could see their own and each other's image. The table top is likely to be made of:

A.

unpolished wood

B.

red stone

C.

glass sheet

D.

wood top covered with cloth

Answer

Correct option: C

Solution

Ans: The correct answer is (c) Glass sheet.

Explanation: Glass sheet is transparent and all of the other objects are opaque and non-reflecting. Therefore, only glass sheets will reflect light properly to form images.

Very Short Answer Questions

Question 8

You have 3 opaque strips with very small holes of different shapes as shown in Fig. 11.5. If you obtain an image of the sun on a wall through these holes, will the image formed by these holes be the same or different?



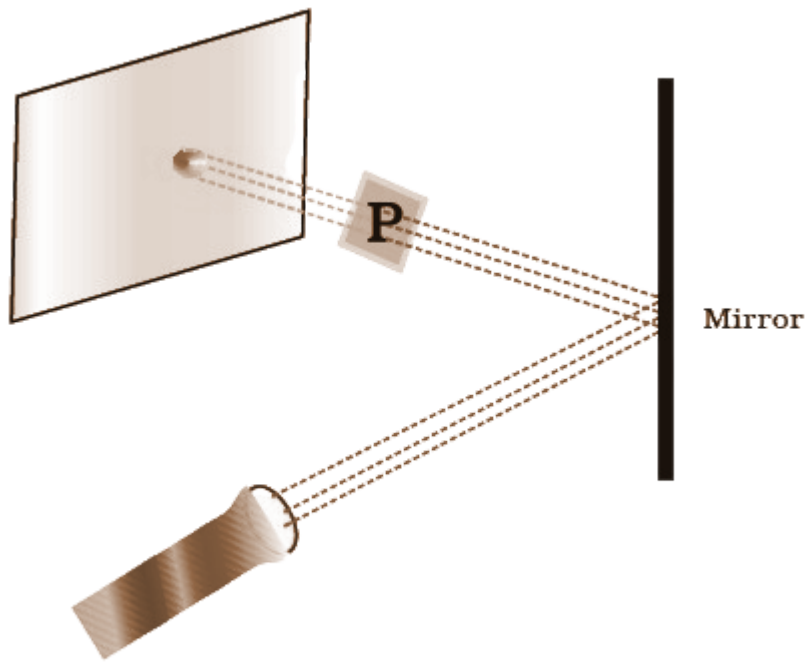
Fig. 11.5

Solution

Ans: The hole in the opaque strips will work as a pinhole camera and an image of the sun will be obtained on the wall. The images formed by these holes will be the same.

Question 9

Observe the picture given in Fig. 11.6. A sheet of some material is placed at position 'P', still the patch of light is obtained on the screen. What is the type of material of this sheet?

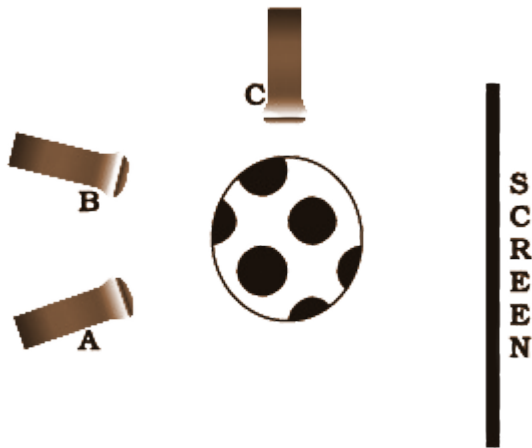


Solution

Ans: Light passes only through transparent material. So, sheet P must be of transparent material like a thin plastic or a ground glass.

Question 10

Three torches A, B and C shown in Fig. 11.7 are switched on one by one. The light from which of the torches will not form a shadow of the ball on the screen.

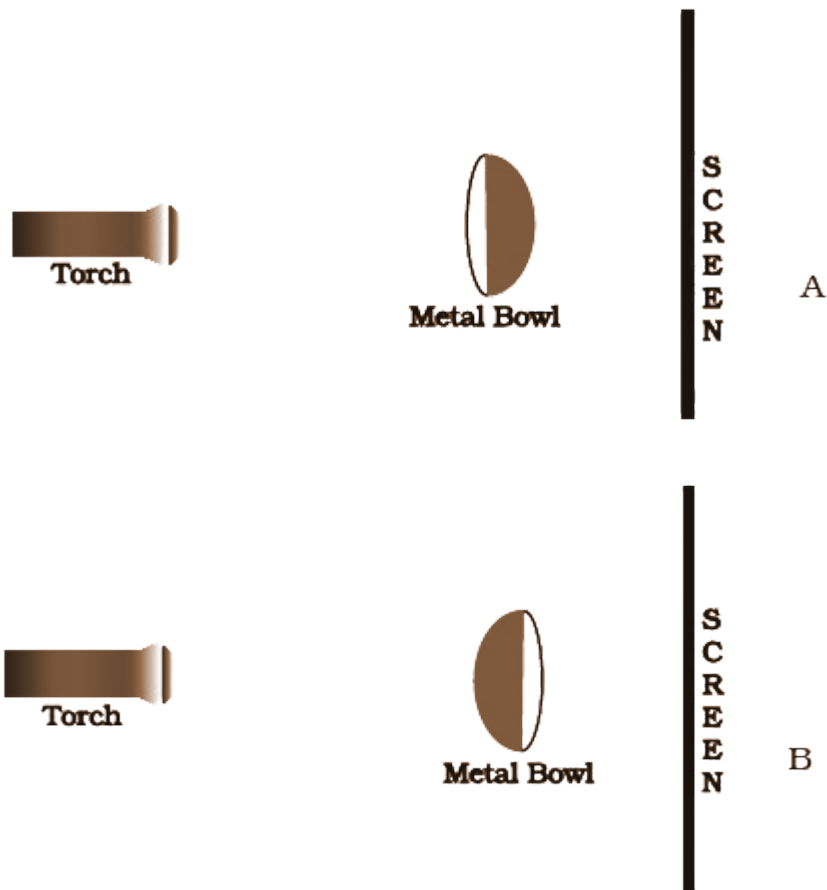


Solution

Ans: We can see in the given image that torch A and B are placed in front of the screen and we know that light travels in a straight line. So, they will form an image. Whereas, torch C is placed parallel to the screen, so it will not form a shadow.

Question 11

Look at the figure given in Fig. 11.8.



Will there be any difference in the shadow formed on the screen in A and B.

Solution

Ans: Formation of image depends on the shape and size of the object. Hence, the shadow formed on screen A and screen B will be the same because the same bowl is used in both the cases.

Short Answer Questions

Question 12

Correct the following statements.

- i) The colour of the shadow of an object depends on its colour.
- ii) Transparent objects allow light to pass through them partially.

Solution

Ans: No. The shadow, whenever formed, is always black in colour or dark. Thus, the colour of the object does not affect the colour of the image.

Ans: Translucent objects are the objects that partially allow light to pass through them. Transparent objects allow light to pass through them completely.

Question 13

Suggest a situation where we obtain more than one shadow of an object at a time.

Solution

Ans: Sometimes light falls on an object from different sources like sun, bulb, etc. at one time, due to which multiple shadows of an object are formed at that moment.

For example, say, there is a football match in which many shadows of a player are being formed at a time. This is because light is falling on him from different sources.

Question 14

On a sunny day, does a bird or an aeroplane flying high in the sky cast its shadow on the ground? Under what circumstances can we see their shadow on the ground?

Solution

Ans: We know that to obtain a shadow the object should be placed near the screen but in the case of a bird or an aeroplane the distance between the object and the ground (that acts as screen) is too much. So, the shadow cannot be seen on the ground to obtain a shadow they must fly at a lower altitude.

Question 15

You are given a transparent glass sheet. Suggest any two ways to make it translucent without breaking it.

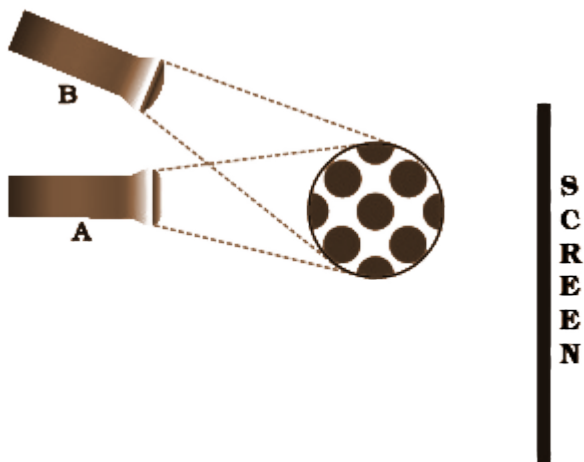
Solution

Ans: We can convert a transparent glass into a sheet that is translucent by following these steps-

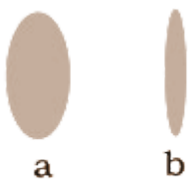
- i) By applying oil or butter on it that makes it partially permeable.
- ii) By rubbing it with sand paper and making the sheet of glass rough, that will allow the light to pass partially.

Question 16

A torch is placed at two different positions A and B, one by one, as shown in Fig. 11.9.



The shape of the shadow obtained in two positions is shown in Fig. 11.10.



Match the position of the torch and shape of the shadow of the ball.

Solution

Ans: Shadow 'a' is formed from position A and shadow 'b' is formed from position B.

Size of the shadow 'a' is bigger than shadow 'b' because in position A ball, torch and screen are in the same line whereas in position B they aren't in the same line.

Question 17

A student covered a torch with a red cellophane sheet to obtain red light. Using the red light she obtains a shadow of an opaque object. She repeats this activity with green and blue light. Will the colour of the light affect the shadow? Explain.

Solution

Ans: We know that the color of shadow remains always dark or black and the screen color or objects color doesn't affect the shadows' color. So, the color of light will not have any effect on the shadow.

Question 18

Is the air around us always transparent? Discuss.

Solution

Ans: We can see buildings, plants etc. because the air around us is usually transparent. But when the air gets polluted it doesn't remain completely transparent. The smoke, dust particles or smog (fog and smoke together) when mixed with air absorbs the light.

Question 19

Three identical towels of red, blue and green colours are hanging on a clothesline in the sun. What would be the colour of shadows of these towels?

Solution

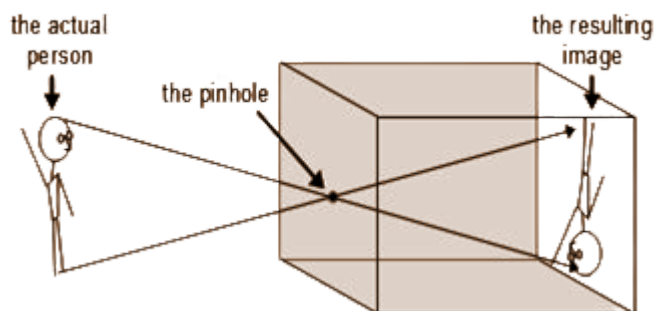
Ans: When the path of light is obstructed by an object, a dark patch is formed which we call shadow. Hence, if no light can reach the region of shadow, the shadow will appear only black in color. As there is always absence of light, the color of shadow doesn't depend on the color of the object.

Question 20

Using a pinhole camera a student observes the image of two of his friends, standing in sunlight, wearing yellow and red shirts respectively. What will be the colours of the shirts in the image?

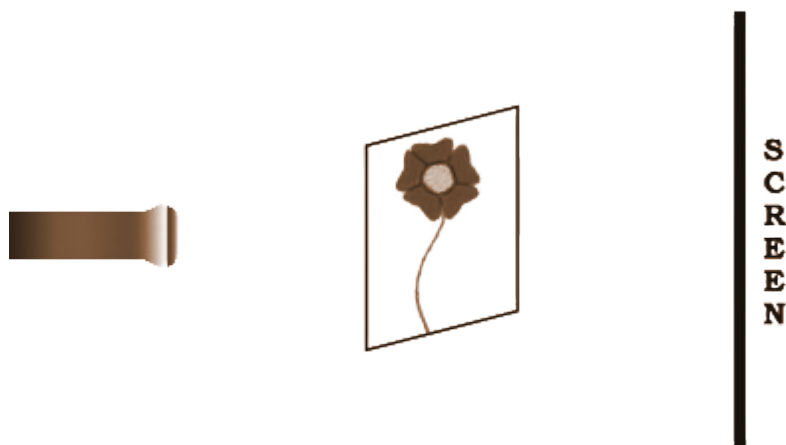
Solution

Ans: Pinhole cameras don't change the color of the image or object. So, the color remains the same as that of the object. We can conclude that the color of shirts will be yellow and red in the image formed too.



Question 21

In Fig. 11.11, a flower made of thick coloured paper has been pasted on the transparent glass sheet. What will be the shape and colour of shadow seen on the screen?



Solution

Ans: The shadow formed on the screen will be the same shape of the given flower but darker in color.

Long Answer Questions

Question 22

A football match is being played at night in a stadium with flood lights ON. You can see the shadow of a football kept at the ground but cannot see its shadow when it is kicked high in the air. Explain.

Solution

Ans: In the case of a ball lying on ground, the ground being an opaque object acts as a screen as the light falls on it, forming a shadow of the ball.

On the other hand when the ball is in air ground is far away from it and hence shadow will disappear as ball goes higher in air.

Question 23

A student had a ball, a screen and a torch in working condition. He tried to form a shadow of the ball on the screen by placing them at different positions. Sometimes the shadow was not obtained. Explain.

Solution

Ans: Some of the reasons because of which the shadow can't be obtained are as follows:

- i) The distance between the ball and screen is too much.
- ii) The light beam from the torch falls parallel to the screen on the wall.
- iii) The torch is placed at a distance from the ball.

Question 24

A sheet of plywood, a piece of muslin cloth and that of a transparent glass, all of the same size and shape were placed at A one by one in the arrangement shown in Fig. 11.12. Will the shadow be formed in each case? If yes, how will the shadow on the screen be different in each case? Give reasons for your answer.



Solution

Ans: Shadow will not be formed in any of the cases except for muslin cloth and plywood.

- i) As muslin cloth is translucent, the light will pass only partially and not completely through the cloth. So, a lighter image will be formed.

ii) A shadow is formed only when the object is opaque, we know that the glass is transparent. Hence, no shadow will be formed.

iii) A perfect dark shadow will be formed in this case as the plywood sheet is an opaque object.

Light- Chapter 11, Class 6 (Science, CBSE)

‘Light’ is the 11th chapter of Class 6th Science in the CBSE board. In this chapter, students will be introduced to the major factor for the survival of all living beings i.e. Light. They will learn about different terminologies that are related to Light. They will learn about the natural source of light, reflections, shadows, and images. This will be interesting for students as they will be fascinated to know the natural phenomenon that we see around us daily. There will be many different activities throughout the lesson which will be done by the students that will increase their curiosity and understanding. One such activity is the activity to show the reflection of Light. This can be done by the students at their homes during the night or in a dark room. They can ask someone to hold a mirror in their hand at one corner of the room and the student may stand at another corner with a torch covering it with their fingers. Directing the beam of torchLight onto the mirror, they will observe that a patch of light is reflected from the mirror. This will help them understand that Light travels in a straight line. Such activities will help the students retain knowledge in their memory.

Vedantu has all the necessary study materials that will be helpful for the students. They are notes that will contain important points and terms, revision notes, sample papers, and solved NCERT solutions. They have been prepared by our subject experts and will be quite easy and understandable for the students. They come in PDF form which can be easily downloaded on the Vedantu platforms by simply logging in or signing up. This will be free of cost, making learning easier and more fun.